TABLE 1.—*Weather conditions, Howland Island, September 26–27, 1924*

Time	Temperature	Humidity	Wind	Velocity	Clouds
Sept. 26 [1]				*mi. per hr.*	
6:00 a. m.	82	74	SE.	10	4 Cl. SW., 2 Ci. St. SW., 1 Cu. E.
8:00 a. m.	86	64	E.	8	7 Ci. SW., 1 Cu. E.
10:00 a. m.	90	56	E.	8	8 Ci. St. SW., few Cu. E.
11:00 a. m.	92	57	E.	10	7 Ci. St. SW., few Cu. E.
12:00 noon	90	56	E.	8	3 Ci. St. SW., 1 Cu. E.
2:00 p. m.	92	55	E.	10	1 Ci. St. SW.
4:00 p. m.	86	66	ESE.	10	3 Ci. S., 1 Cu. NE.
4:30 p. m.	84	69	ESE.	10	4 Ci. S., 1 Cu. E.
5:00 p. m.	82	72	ESE.	10	2 Ci. SW., 1 Cu. E.
6:00 p. m.	80	75	ESE.	6	5 Ci. SE., 1 Cu. E.
Sept. 27 [2]					
6:00 a. m.	79	86	SE.	2	6 Cu. SE.
6:30 a. m.	82	76	E.	4	5 Cu. SE.
7:00 a. m.	82	78	E.	4	2 Cu. E.
8:00 a. m.	86	75	E.	6	2 Cu. E.
9:00 a. m.	88	77	E.	6	2 Cu. E.
10:00 a. m.	90	78	E.	6	1 Cu. E.
11:30 a. m.	94	61	E.	6	3 Cu. E.
12:00 noon	94	66	E.	8	4 Cu. E.
2:00 p. m.	88	72	E.	8	2 Cu. E.
4:00 p. m.	86	70	E.	8	1 Cu. E.

[1] Maximum temperature for the day, estimated, 93°; minimum, estimated, 78°. No rain fell on island, but several rain squalls occurred over the ocean in the near vicinity.
[2] Maximum temperature for day, estimated, 95°; minimum temperature, estimated, 78°. No rain fell on the island, but there were several rain squalls during the night over the surrounding ocean.

Cloudiness was greatest on the islands during the night, and least in the early afternoon or late morning. About 4 o'clock in the afternoon the clouds—huge, towering cumuli—began to form, and by sunset a considerable portion of the sky was covered with them. Shortly after sunrise they disappeared, somewhat, so that during the day what clouds there were were small. Considerable cirrus cloud was observed at times during the stay on the islands. The lack of cloudiness during the day was another point in which actual conditions showed themselves to be different from expected conditions.

Humidity variation was not very great, as the table shows, the highest reading, of course, being at night and the lowest during the early afternoon. Far lower humidity was found to prevail on the island than had been expected, however. During the stay on the islands no rain fell. From the appearance and scantiness of the vegetation it is doubtful if as much as 3 inches of rain falls on the islands in a year. However, this is nothing more than a guess, there being nothing tangible on which to base a conclusion.

From the 14 observations of upper-air wind directions and velocities very little could be learned. The balloons were carried away too quickly to be followed for any great length of time. In addition it is thought that water vapor in the lower air, caused by evaporation from the ocean's surface, caused a hazy condition which interfered materially with the observation of the balloons. The highest altitude reached with a balloon was 2,320 meters (7,612 feet), at which altitude the direction of the wind was 83°, [north being 0°] compared with 85° at the surface; the velocity was 9.8 meters per second (22 miles an hour). The highest velocity encountered during any of the balloon observations was 17.6 meters per second (39 miles an hour). This was found at an altitude of 1,680 meters (5,512 feet).

TABLE 2.—*Average velocity and direction of wind at various altitudes, Howland Island, September 26, 27, 1924*

Minutes of observations	Altitude *Meters*	Velocity *m. p. s.*	Direction (north=0°)
0	0	3.7	90
1	192	9.6	100
2	368	9.2	101
3	544	9.3	101
4	712	9.8	99
5	880	10.4	98
6	1,040	9.7	96
7	1,200	10.9	93
8	1,360	10.6	100
9	1,520	10.8	98

Two facts of interest were gathered from the balloon observations: First, that the velocity of the balloon at the end of the first minute of observation, when about 190 meters (623 feet) above the surface was considerably greater than the velocity at the surface. An outstanding example of this was the first observation made, with a velocity at the surface of 3.6 meters per second (8 miles an hour) and a velocity at the end of the first minute of 14.0 meters per second (31 miles and hour). The average velocity of the wind at the surface for the 14 observations was 3.7 meters per second (8 miles and hour) and at the end of the first minute it was 9.6 meters per second (22 miles an hour). In most cases the velocity at the end of the second minute was somewhat less than at the end of the first. The second point in the balloon observations worthy of note was the steadiness of direction of the wind. At all times throughout the course of the balloons' flights the wind blew from a point within a few degrees of east. During the course of any one balloon flight the direction of the wind at various altitudes varied, on an average, only 7°. The greatest variation in any one run was 19°. Although no definite tendency of the wind in the course of the flights either to veer or to back can be claimed, the wind backed in more cases than it veered. That is (see table) starting with a surface wind from 90°, at the end of the first minute it had veered to 100°; at the end of the second it had veered to 101°; at the end of the third it was 101°; and then it commenced to back, first 99°, then 98°, next 96°, and so on.

Conditions as found on the islands might be summed up thus: Maximum temperature, about 94°, minimum about 78°; humidity comparatively low; wind, prevailing from the east, varying slightly during the daytime and backing to southwest for a short time at night; highest velocity about 15 miles an hour in early afternoon, falling to 3 or 4 miles an hour at night; sky partly cloudy to cloudy at night, and from 8 in the morning until 4 in the afternoon, clear, with only small clouds floating by; barometric pressure quite constant, varying only diurnally.

A 55-YEAR RECORD OF RAINFALL IN BERMUDA

Mr. William H. Potter, of Washington, D. C., has very kindly taken the trouble to compile and send to the REVIEW a valuable record of Bermuda rainfall, which we are glad of having the opportunity to make available in permanent form. The following explanatory notes are quoted from Mr. Potter's letter accompanying the record:

The records from 1870 to 1896 inclusive were copied from those published in the Bermuda Almanack of current dates and were taken by a Mr. Gosling. The records seem to have been carefully taken and show no great discrepancies. The amounts seem a little large in comparison with the later records, but I think they are fully as reliable as any old records taken by an amateur. The records from 1897 on were taken from those of the Prospect Observatory as published in the Colonial Blue Book, but supplemented in a large part by personal investigation of the original records. * * * No attempt has been made at the Observatory to make and keep a summarized record of the observations. * * *

There have been other records of rainfall in Bermuda, some taken by the Royal Engineers from 1855 to the eighties but not consecutively; another set, 1855 to 1862, by the Navy at the dockyard, but neither of these sets seems to me to be very reliable.

The importance of the records I am sending lies in the fact that they are taken in a spot on the globe where it is practically impossible to get records within about 700 miles in one direction and much farther in the others, and my object in sending them * * * is to have them placed on record permanently * * * for the sources from which I compiled them are scattered and difficult to get at.

TABLE 1.—*Monthly and annual amounts and averages of rainfall at Hamilton, Bermuda, 1870–1924*

[Values for 1870–1896 from observations by Mr. Gosling published in the Bermuda Almanack; for 1897–1924 from the Colonial Blue Book, supplemented by investigation of original records at the Prospect Observatory, Bermuda]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1870	5.54	7.00	5.58	3.21	5.20	2.94	1.92	2.23	7.32	1.18	4.21	5.67	52.00
1871	1.50	1.19	3.21	5.20	3.64	3.63	4.57	4.37	4.65	3.86	5.11	6.06	46.99
1872	4.31	4.17	6.61	6.26	1.28	4.96	9.48	8.03	4.64	6.53	4.12	8.02	68.41
1873	6.72	6.96	6.97	4.41	7.21	2.31	4.46	1.95	1.83	2.46	6.32	5.06	56.66
1874	3.51	4.75	6.43	2.25	2.45	3.83	5.68	11.30	5.85	16.50	5.40	3.25	71.20
1875	2.50	2.56	1.78	5.00	6.33	1.88	4.17	1.75	5.69	6.45	2.42	4.30	44.83
1876	1.66	4.47	5.80	3.51	5.59	8.41	2.56	1.52	7.59	7.00	4.14	7.35	59.60
1877	2.97	11.00	6.13	2.45	6.94	7.01	4.73	8.84	4.45	1.33	6.53	3.43	65.81
1878	5.79	7.80	5.81	3.41	4.10	5.47	5.68	9.69	5.98	5.38	5.78	3.36	68.25
1879	4.64	5.55	5.04	3.52	4.89	4.21	8.59	4.67	5.39	2.76	3.58	3.15	55.99
1880	3.44	4.45	3.07	1.57	3.84	3.20	4.19	6.23	2.70	7.97	5.66	5.99	52.31
1881	3.45	2.89	8.05	3.11	3.30	5.80	7.65	4.44	5.45	3.14	2.67	6.67	56.62
1882	3.80	3.07	4.46	2.47	9.13	3.68	6.74	6.04	6.40	5.87	8.61	4.53	64.80
1883	1.39	0.96	5.64	3.21	6.07	3.52	6.37	3.27	2.76	10.74	3.14	5.99	53.06
1884	3.97	3.43	3.34	4.60	2.37	6.53	5.56	8.07	2.98	4.85	11.78	5.29	62.77
1885	3.94	7.65	9.03	5.82	9.70	1.61	3.24	5.29	2.30	9.25	12.48	5.24	75.55
1886	4.56	7.12	5.76	1.36	2.36	1.48	18.62	5.60	3.98	4.47	5.25	3.63	64.19
1887	6.89	1.60	3.19	3.81	9.45	4.67	2.64	5.08	2.65	2.17	6.73	5.50	54.38
1888	5.82	4.24	3.00	2.47	1.07	7.79	7.28	4.74	3.12	5.98	6.37	8.45	60.33
1889	7.40	6.51	4.43	11.09	13.13	2.32	5.76	4.05	4.64	6.99	1.35	3.90	71.57
1890	1.78	4.01	5.09	3.81	7.54	8.42	5.68	2.04	4.15	6.54	5.54	5.10	59.70
1891	4.07	4.73	7.19	5.60	5.81	5.57	3.25	13.75	8.15	9.72	5.04	0.80	73.68
1892	3.92	6.42	5.43	2.51	0.87	3.86	3.91	6.95	3.45	15.32	5.89	2.91	61.44
1893	6.07	1.73	7.90	2.13	5.95	8.62	3.77	4.35	2.56	1.99	4.09	3.76	52.92
1894	5.81	3.29	2.52	2.59	6.05	3.12	3.39	5.03	9.52	9.13	3.05	5.99	59.49
1895	3.52	5.39	5.49	6.07	2.45	6.97	6.67	2.45	7.88	6.40	3.51	5.75	62.55
1896	6.69	4.99	8.32	1.39	2.76	4.43	1.53	5.22	4.85	5.44	3.45	5.14	54.21
1897	4.42	2.21	2.11	5.80	4.15	7.84	4.94	7.97	3.51	6.82	1.19	3.62	54.58
1898	2.81	4.47	0.62	7.10	1.46	6.20	2.71	3.90	3.41	2.05	5.64	1.45	41.82
1899	5.20	2.80	3.56	5.79	4.20	3.40	6.93	5.38	11.09	1.39	6.82	4.76	61.32
1900	6.92	4.93	4.74	1.47	6.94	4.08	2.19	5.25	7.95	4.07	3.60	8.74	60.88
1901	9.44	4.87	7.82	6.45	1.33	1.63	2.08	1.62	1.37	9.85	7.04	2.09	55.59
1902	3.73	7.41	3.73	12.65	2.95	6.80	1.71	16.54	2.05	10.01	3.16	5.69	76.43
1903	3.37	1.79	3.35	4.54	3.88	4.35	2.05	2.96	7.80	6.26	3.87	6.32	50.54
1904	5.91	3.68	3.28	2.39	9.09	5.42	6.28	4.58	1.60	8.10	2.60	2.38	55.31
1905	3.18	3.20	1.74	6.80	6.16	4.92	5.32	6.38	2.52	5.20	5.50	9.64	60.56
1906	6.70	8.52	6.94	3.32	2.32	2.04	1.00	4.46	3.82	11.74	4.96	5.36	61.18
1907	1.48	5.76	1.58	4.82	3.88	4.82	2.24	3.16	3.34	7.02	1.76	5.48	45.34
1908	4.46	5.78	8.98	4.32	2.62	2.64	2.14	1.82	5.68	9.62	4.24	1.36	53.66
1909	5.16	4.26	4.94	2.06	3.82	2.12	7.46	5.82	15.00	7.66	5.22	5.44	68.96
1910	9.42	4.26	3.00	9.30	5.36	0.88	1.18	0.64	6.50	4.92	3.30	4.38	53.14
1911	1.78	1.18	2.40	1.72	2.82	6.14	1.66	7.24	2.94	1.40	7.00	3.28	39.56
1912	6.54	3.66	4.82	3.28	1.70	2.98	11.24	7.76	1.78	2.16	3.24	2.22	51.38
1913	2.20	5.90	3.34	1.94	1.32	2.10	2.22	8.86	1.84	4.22	11.36	3.68	48.98
1914	6.18	10.40	5.20	3.90	5.16	2.08	1.74	4.78	6.58	4.08	1.04	10.46	61.60
1915	2.84	3.52	6.70	2.36	1.82	10.98	4.37	4.79	16.13	1.33	2.90	2.85	60.59
1916	1.68	5.07	5.44	3.20	1.64	2.12	5.45	5.36	6.98	3.08	7.00	2.54	49.56
1917	3.32	2.56	1.92	1.88	4.18	6.08	3.00	4.82	7.94	17.42	3.06	6.84	63.02
1918	3.80	1.34	2.72	8.80	0.80	7.96	4.54	8.14	7.56	2.88	11.44	4.18	64.16
1919	6.56	3.60	2.17	4.64	2.36	2.82	0.84	6.92	5.62	2.51	4.28	6.52	48.84
1920	4.04	6.26	10.05	1.44	8.46	1.45	3.53	3.60	2.23	3.11	3.80	4.55	52.52
1921	5.99	5.54	1.36	2.57	8.07	2.59	1.50	4.75	4.09	5.03	6.27	6.67	54.43
1922	5.95	3.33	1.67	2.92	3.37	10.26	2.95	3.87	6.90	5.81	3.67	3.16	53.86
1923	4.40	3.23	4.71	4.05	5.14	1.62	2.27	2.40	4.40	5.18	5.31	2.52	45.23
1924	3.17	5.61	6.68	3.34	5.19	4.65	7.66	6.14	3.84	4.77	4.01	1.57	56.63
Means	4.48	4.60	4.74	4.10	4.54	4.49	4.53	5.40	5.19	5.95	5.01	4.78	57.80

TABLE 2.—*Average monthly and annual number of days with rainfall of 0.25 inch or more and 0.01 inch or more, Hamilton, Bermuda, 1897–1924*

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
0.25 inch or more [1]	6	5	5	4	4	4	4	6	5	6	5	5	58
0.01 inch or more [2]	16	14	13	11	10	11	12	14	13	14	15	15	158

[1] Means derived by W. H. Potter from the original unpublished records.
[2] From the records of the Prospect Observatory as published in the Blue Books of the colony. This table is given "as the records were made, but it is apparent from the original records that all rainfalls under 0.02 inch were recorded as 'trace' in the earlier years, so the number of 'rainy days' is somewhat less than it should be."

TABLE 3.—*Amounts and averages, by months, of the greatest daily rainfall, Hamilton, Bermuda, 1897–1924*

[From the records of the Prospect Observatory as published in the Blue Books, supplemented by investigation of the original records]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1897	0.82	1.11	0.65	2.46	1.32	2.42	2.20	2.15	0.90	2.50	0.41	1.62	2.50
1898	1.12	1.70	0.48	1.90	0.40	1.15	0.82	1.06	1.08	0.47	1.90	0.40	1.90
1899	1.30	0.72	0.92	1.46	1.15	2.50	3.35	1.10	3.73	0.75	3.54	2.26	3.73
1900	2.30	1.02	0.93	0.46	1.52	1.64	1.01	1.52	2.74	1.50	0.84	2.87	2.87
1901	3.02	1.45	4.80	2.37	0.42	0.44	0.80	0.37	0.22	2.41	1.52	0.67	4.80
1902	1.06	3.28	0.94	10.75	0.80	4.70	0.55	3.08	0.81	3.21	1.77	1.43	10.75
1903	0.65	0.71	1.02	1.50	2.17	1.68	1.02	1.01	4.55	1.70	1.18	1.00	4.55
1904	1.04	0.92	1.14	1.82	3.30	1.56	1.10	1.02	0.54	1.54	0.58	0.84	3.30
1905	0.50	0.70	0.64	3.12	3.90	2.06	1.04	1.20	0.96	1.70	0.72	4.64	4.64
1906	2.48	1.94	1.96	0.96	1.36	1.40	0.48	1.12	1.44	3.16	3.10	1.04	3.16
1907	0.54	1.12	0.62	1.80	1.04	1.52	1.20	0.86	0.78	2.16	0.64	1.38	2.16
1908	1.12	1.44	5.86	1.90	0.94	0.88	0.50	0.56	2.02	2.78	1.58	0.26	5.86
1909	3.16	1.46	0.88	0.86	0.92	0.80	1.74	2.90	6.58	2.90	1.20	0.78	6.58
1910	3.84	1.64	1.34	4.96	3.36	0.30	0.40	0.20	1.96	2.60	0.86	1.36	4.96
1911	0.48	0.30	0.50	0.96	1.48	1.56	0.44	1.94	1.62	0.78	2.44	1.24	2.44
1912	1.56	1.22	1.40	1.32	0.52	0.70	2.76	1.66	0.66	0.84	1.00	0.42	2.76
1913	0.56	1.16	0.86	0.56	0.72	0.66	0.78	2.72	0.76	1.04	3.62	1.08	3.62
1914	1.90	2.72	1.22	1.18	3.06	0.72	0.64	1.64	2.26	1.40	0.34	1.68	3.06
1915	1.00	0.80	1.56	0.88	0.48	2.38	2.89	2.61	6.06	0.42	0.93	0.59	6.06
1916	0.50	1.59	1.19	1.11	0.87	0.79	1.41	2.79	2.14	1.98	1.96	0.72	2.79
1917	1.36	0.74	0.44	0.66	1.20	2.08	1.70	0.78	2.46	5.04	0.80	1.24	5.04
1918	1.14	0.52	1.02	2.42	0.48	1.54	1.70	2.38	3.24	0.62	3.20	2.56	3.24
1919	1.22	0.58	0.44	1.16	1.72	0.82	0.32	1.64	1.36	0.86	0.82	0.98	1.72
1920	0.76	1.44	1.70	0.44	5.09	0.82	1.18	0.97	0.46	1.44	1.30	0.92	5.09
1921	2.50	3.30	1.03	1.16	5.50	0.80	0.70	1.64	0.94	2.04	1.98	1.90	5.50
1922	1.02	0.92	0.36	1.36	2.14	8.00	0.72	1.46	4.91	1.49	0.84	0.76	8.00
1923	1.10	0.98	0.91	1.14	2.29	1.36	0.86	0.72	1.79	2.28	1.00	1.50	2.29
1924	1.30	1.88	1.85	1.20	1.44	2.15	3.12	2.10	1.88	2.74	1.04	0.66	3.12
Means	1.41	1.33	1.31	1.85	1.77	1.69	1.27	1.54	2.10	1.87	1.47	1.31	4.16

NOTES, ABSTRACTS, AND REVIEWS

SOLAR-CONSTANT VALUES

Values of the solar constant were last published in this REVIEW for February, 1923.[1] Doctor Abbot has just issued a report under the title "Provisional Solar-Constant Values, August, 1920, to November, 1924,"[2] which brings the record of daily solar constant values down to the end of November, 1924. Doubtless a copy of the report can be supplied by Doctor Abbot, whose address is Smithsonian Institution, Washington, D. C.—EDITOR.

THE METEOROLOGICAL WORK OF THE "JACQUES-CARTIER"

By E. DELCAMBRE, National Meteorological Office of France

[Translated from *Comptes Rendus*, 179, No. 23, December 8, 1924, pp. 1337–1339, by B. M. Varney, Weather Bureau, Washington]

The Compagnie Générale Transatlantique and the National Meteorological Office of France, in cooperation, have organized and developed continuously since 1921 a special meteorological service on board of the *Jacques-Cartier*, school ship for the regular transatlantic service. The object of this note is to summarize briefly the principal results so far attained.

1. *The extension of the réseau of synoptic observations assembled by radio for purposes of forecasting on land.*—The uninterrupted reception on a continent, of the international observations made four times daily on shipboard during an entire Atlantic crossing, was realized in January 1923 from the *Jacques-Cartier* en route from Le Havre to New Orleans. In the eastern Atlantic, transmission to Brest is direct; in the western Atlantic or in the Pacific, a relay via Washington is necessary.

Still more important is the fact that the *Jacques-Cartier* is the first floating station for the assembling and retransmission to land, of the observations made on other ships. This organization is extremely useful because, first, most ships are equipped only with wireless sending apparatus which is too weak to permit of reaching the mainland unless the vessel is fairly close to the coast, second, the necessities of commercial traffic are usually incompatible with the difficulties and the loss of time

[1] Values of the solar constant, 1920–1922, by C. G. Abbot and colleagues. MO. WEA. REVIEW 51: 71–81.
[2] Smithsonian Misc. Coll. 77: No. 3.